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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/429,446	10/28/1999	LYNDON W. GRAHAM	SEM4492P0771	5945

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EXAMINER

LEADER, WILLIAM T

ART UNIT	PAPER NUMBER
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1742

DATE MAILED: 03/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No.	Applicant(s)	
	09/429,446	GRAHAM ET AL.	
	Examiner	Art Unit	
	William T. Leader	1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 December 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 15-34, 44 and 45 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 15-34, 44 and 45 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Receipt of the papers filed on December 15, 2003, is acknowledged. New claims 44 and 45 have been presented. Claims 15-34, 44 and 45 are pending.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 103

3. Claims 15, 44 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Poris (5,256,274) in view of the Lowenheim text *Electroplating* and Ameen et al (US 5,685,970) for the reasons given in the previous office action and in view of the following comments.
4. Claims 16-19 and 32-34 rejected under 35 U.S.C. 103(a) as being unpatentable over Poris (5,256,274) in view of the Lowenheim text *Electroplating* and Ameen et al (US 5,685,970) as applied to claims 15, 44 and 45 above, and further in view of Young et al (4,705,606) and Tamaki et al (5,227,001) for the reasons given in the previous office action and in view of the following comments.

5. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Poris (5,256,274) in view of the Lowenheim text *Electroplating* and Ameen et al (US 5,685,970) as applied to claims 15, 44 and 45 above, and further in view of Inoue et al (5,556,814) for the reasons given in the previous office action and in view of the following comments.

6. Claims 21-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Poris (5,256,274) in view of the Lowenheim text *Electroplating* and Ameen et al (US 5,685,970) and further in view of Inoue et al (5,556,814) as applied to claim 20 above, and additionally in view of Abys (4,427,502) and Dubin et al (5,972,192) for the reasons given in the previous office action and in view of the following comments.

7. Claims 27-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Poris (5,256,274) in view of the Lowenheim text *Electroplating* and Ameen et al (US 5,685,970) and further in view of Inoue et al (5,556,814) as applied to claim 20 above, and further in view of additional pages of Lowenheim and Dubin (5,972,192) for the reasons given in the previous office action and in view of the following comments.

8. Claims 15, 20, 44 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Andricacos et al (5,789,320) in view of either Nitayama et al (6,236,079) or Lu et al (5,595,928) and further in view of the Lowenheim text *Electroplating* and Ameen et al (US 5,685,970) for the reasons given in the previous office action and in view of the following comments.

9. Claims 16-19 and 32-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Andricacos et al (5,789,320) in view of either Nitayama et al (6,236,079) or Lu et al (5,595,928) and further in view of the Lowenheim text *Electroplating* and Ameen et al (US 5,685,970) as applied to claims 15, 20, 44 and 45 above, and additionally in view of Young et al (4,705,606) and Tamaki et al (5,227,001) for the reasons given in the previous office action and in view of the following comments.

10. Claims 21-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Andricacos et al (5,789,320) in view of either Nitayama et al (6,236,079) or Lu et al (5,595,928) and further in view of the Lowenheim text *Electroplating* and Ameen et al (US 5,685,970) as applied to claims 15, 20, 44 and 45 above, and further in view of Abys (4,427,502) and Dubin et al (5,972,192).

11. Claims 27-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Andricacos et al (5,789,320) in view of either Nitayama et al (6,236,079) or Lu et al (5,595,928) and further in view of the Lowenheim text *Electroplating* and Ameen et al (US 5,685,970) as applied to claims 15, 20, 44 and 45 above, and further in view of additional pages of Lowenheim and Dubin et al (5,972,192).

Response to Amendment

12. Applicant's Remarks have been carefully considered but are not deemed to be persuasive. At page 5 applicant states the new claim 44 specifically recites when the higher current electroplating power is initiated immediately after the first predetermined period of time, while new claim 45 recites in an alternative manner when the higher current electroplating power is initiated. The newly added limitations of claims 44 and 45 are not considered to distinguish over the prior art as applied. As pointed out in the previous office action, both Lowenheim and Ameen et al recognize that the rate of metal deposition is basically dependent on the current which can be applied to the metal on the substrate, and that the current is limited by the thickness, as well as the current-carrying characteristics, of the metal on the substrate (column 2, lines 34-40). The references suggest the application of the higher current density (electroplating power) as soon as the current-carrying capacity has been increased to a degree where higher current can

be tolerated. Thus, one of ordinary skill in the art would appreciate that the higher current density could be applied immediately after the lower current density.

Claim 45 recites initiation of the higher current electroplating power after the thickness has increased beyond a predetermined magnitude. The expression "predetermined magnitude" reads on any of the possible range of magnitudes. The prior art of record discloses increasing current after a finite amount of metal has been deposited to increase conductivity and clearly suggests the limitation of claim 45.

13. Applicant argues that there is no suggestion in the applied art to combine the teachings of the secondary references with those of the primary references, and that the secondary references are directed to an entirely different field of endeavor. This argument is not convincing. The secondary references relate to electrodeposition upon a thin initial layer with limited current-carrying capacity. This is the same situation occurring in the primary references. Thus the teachings of the secondary references are appropriate. Additionally, the Lowenheim text explains Faraday's Laws. These laws govern all electroplating processes and are applicable to the processes of the primary references.

14. Applicant's amendment, which presented new claims 44 and 45, necessitated the new ground(s) of rejection of these claims presented in this Office action.

Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to William T. Leader whose telephone number is 571-272-1245. The examiner can normally be reached on Mondays-Thursdays and alternate Fridays, 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King, can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



William Leader
March 16, 2004



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